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1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE 1994		3. REPORT TYPE AND DATES COVERED Journal article	
4. TITLE AND SUBTITLE Hepatitis E virus in Indonesia				5. FUNDING NUMBERS PE - 62787A PR - 001.01 TA - ENX WU - 1438	
6. AUTHOR(S) Jennings CB; Lubis I; Listiyaningsih E; Burans JP; Hyams KC					
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Medical Research Institute Commanding Officer 8901 Wisconsin Avenue Bethesda, Maryland 20889-5607				8. PERFORMING ORGANIZATION REPORT NUMBER NMRI 94-26	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) Naval Medical Research and Development Command National Naval Medical Center Building 1, Tower 12 8901 Wisconsin Avenue Bethesda, Maryland 20889-5606				10. SPONSORING/MONITORING AGENCY REPORT NUMBER DN244527	
11. SUPPLEMENTARY NOTES Reprinted from: Transactions of the Royal Society of Tropical Medicine and Hygiene 1994 Vol.88 p.57					
12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release; distribution is unlimited.				12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words) 					
14. SUBJECT TERMS viral hepatitis; epidemiology; hepatitis E virus; public health; enterically transmitted diseases				15. NUMBER OF PAGES 1	
				16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT Unclassified		18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified		19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	
				20. LIMITATION OF ABSTRACT Unlimited	

NSN 7540-01-280-5500

DTIC QUALITY INSPECTION
DTICStandard Form 296 (Rev 2-85)
Prescribed by ANSI Std Z39-18
296-102

Short Report

Hepatitis E virus in Indonesia

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Hepatitis E virus (HEV) has been identified as a major cause of enterically transmitted non-A, non-B hepatitis (ET-NANBH) (BRADLEY, 1992). The geographical distribution of HEV transmission in south-east Asia is unknown, although transmission has been reported in Hong Kong (LOK *et al.*, 1992), and HEV complementary deoxyribonucleic acid has been identified in faecal material from patients with acute hepatitis living in West Kalimantan (formerly Borneo), Indonesia (REYES *et al.*, 1990). The West Kalimantan samples were collected during an ET-NANBH outbreak in 1987 that was reported to have affected 2000 Indonesians (BRADLEY, 1992). Since that time, similar ET-NANBH outbreaks have been reported from the same area in 1989 and 1991 (I. Lubis, unpublished data). HEV may also be common on other islands in the Indonesian archipelago (RUSSELL, 1990). Using a recently developed enzyme immunoassay (EIA) for antibody to hepatitis E virus (anti-HEV) (GOLDSMITH *et al.*, 1992), we evaluated recurrent HEV transmission in West Kalimantan, Indonesia.

Eighty-nine serum samples from patients with acute hepatitis during the 1991 outbreak were analysed. All sera were tested for anti-hepatitis A virus immunoglobulin M (anti-HAV IgM), hepatitis B surface antigen (HBsAg) and anti-hepatitis core antigen (anti-HBc) IgM by EIA (Abbott Laboratories, Abbott Park, Illinois, USA). Sera were also tested by EIA (Diagnostic Biotechnology, Singapore) for antibody to hepatitis C virus (anti-HCV). A commercially-available EIA (kindly supplied by L. Chan, Diagnostic Biotechnology) was used to detect total anti-HEV, based on previously described methods (LOK *et al.*, 1992). To evaluate HEV infection further, 30 serum samples were 'blindly' assayed for anti-HEV IgM and immunoglobulin G (IgG) by Western blotting, as described previously (HYAMS *et al.*, 1992).

All 89 sera from patients with acute hepatitis were negative for anti-HAV IgM and anti-HBc IgM, but 21 (23%) had HBsAg without anti-HBc IgM and 2 (2%) had anti-HCV. The sera of 79 (88%) patients were reactive for anti-HEV by EIA. Western blot analysis of 25 EIA positive samples showed that 8 (27%) were positive for

both IgM and IgG anti-HEV, and 3 (10%) were positive for IgG alone. All 5 of the samples negative by EIA for anti-HEV were also negative by Western blotting.

Both an epidemic and sporadic endemic form of HEV transmission have been described (BRADLEY, 1992). The current investigation indicates that repeated outbreaks of HEV infection can also occur in the same geographical area. A more thorough investigation is planned to determine the source of recurrent HEV transmission in West Kalimantan, Indonesia, and to determine the degree of immunity after HEV infection and whether acute clinical hepatitis E can occur more than once in the same individual. The ease and availability of the EIA for anti-HEV will be of great benefit for the diagnosis of acute hepatitis E when combined with clinical findings and the absence of other hepatitis markers. The reason why a higher percentage of serum samples were positive for anti-HEV by EIA than by Western blotting will require further investigation.

This research was supported by the Naval Medical Research and Development Command, Work Unit 3M162787A870 AR8. The views expressed in this article are the private ones of the authors and are not to be construed as reflecting those of the US Department of the Navy or the Department of Defense.

References

- Bradley, D. W. (1992). Hepatitis E: epidemiology, aetiology, and molecular biology. *Reviews in Medical Virology*, 2, 19-28.
- Goldsmith, R., Yarbough, P. O., Reyes, G. R., Fry, K. E., Gabor, K. A., Kamel, M., Zakaria, S., Amer, S. & Gaffar, Y. (1992). Enzyme-linked immunosorbent assay for diagnosis of acute sporadic hepatitis E in Egyptian children. *Lancet*, 339, 328-331.
- Hyams, K. C., Purdy, M. A., Kaur, M., McCarthy, M. C., Hussain, M. A. M., El-Tigani, A., Krawczynski, K., Bradley, D. W. & Carl, M. (1992). Acute sporadic viral hepatitis in Sudanese children: analysis based on a new western blot assay. *Journal of Infectious Diseases*, 165, 1001-1005.
- Lok, A. S. F., Kwan, W., Moeckli, R., Yarbough, P. O., Chan, R. T., Reyes, G. R., Lai, C., Chung, H. & Lai, T. S. T. (1992). Seroepidemiological survey of hepatitis E in Hong Kong by recombinant-based enzyme immunoassays. *Lancet*, 340, 1205-1208.
- Reyes, G. R., Purdy, M. A., Kim, J. P., Luk, K., Young, L. M., Fry, K. E. & Bradley, D. W. (1990). Isolation of a cDNA from the virus responsible for enterically transmitted non-A, non-B hepatitis. *Science*, 247, 1335-1339.
- Russell, M. L. (1990). Probable enteric non-A, non-B hepatitis in a returned traveller—Alberta. *Canadian Diseases Weekly Report*, 16, 75-76.

Received 28 June 1993; revised 3 August 1993; accepted for publication 5 August 1993

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